

LOCKHEED AERONAUTICAL SYSTEMS COMPANY

GROUNDWATER AND SOIL TREATMENT FACILITY BRIEFING

FEATURED SPEAKERS

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FOR IMMEDIATE RELEASE

LOCKHEED BEGINS GROUNDWATER TREATMENT  
IN BURBANK WITH \$4 MILLION FACILITY

BURBANK, Calif., Nov. 3--More than a million-and-a-half gallons of water are now being cleaned daily by a new \$4-million groundwater treatment facility constructed by Lockheed Aeronautical Systems Company.

The first of its kind for groundwater and soil treatment, the system represents part of the more than \$10 million Lockheed has spent over the past five years to monitor, test and clean in an area of Burbank where high levels of industrial solvents have been detected.

Unlike others of its type, the new Aqua-Detox facility has been designed so that none of the volatile organic compounds it separates from the subsurface water and soil are expelled into the atmosphere; instead, they are contained and recycled.

"We wanted the most environmentally sound system possible. With Aqua-Detox we aren't discharging any waste products other than clean water," said Dr. Ed Faeder, Lockheed director of environmental protection and safety.

"Working with the California Regional Water Quality Control Board, we defined the requirement, developed a plan and then implemented it in the shortest possible time," Faeder said.

HOW LOCKHEED'S AQUA-DETOX GROUNDWATER TREATMENT FACILITY WORKS

## GROUNDWATER CLEANING

1. Water is extracted from a 350-foot-deep well located near the facility.
2. The water is pumped to the top of a 60-foot stripping tower.
3. Inside the tower the water cascades through a packing material that increases its exposed surface area. The tower is under vacuum pressure and is permeated with steam, which increases the tendency for solvents in the water to vaporize.

By the time the water reaches the bottom of the tower, the solvents have separated, leaving water that contains concentrations of solvents below those permitted for drinking water.

4. The vapor containing the solvents, which had been separated from the water, is condensed and pumped to a storage tank. Once a month the stored solvents are collected for recycling to industry users.
5. The cleaned water is discharged back into the ground at an injection well located some distance away from the facility. Water is now being temporarily discharged down a storm drain.

## SOIL-GAS TREATMENT

- A. To treat soil gases in the ground, wells at depths of approximately 150 feet (above the water table level) are utilized. Pumps extract soil gas from these wells and transport it into tanks containing beds of granular-activated carbon, which filters out chlorinated hydrocarbons.
- B. Vapors from this process are condensed and transferred to the storage tank containing the solvents collected from the groundwater.
- C. Clean soil gas is then reinjected into the ground nearby, at depths ranging from 50 feet to 150 feet. This speeds up the cleaning process by forcing air through the contaminated soil, where it picks up additional hydrocarbons, and enters the system to begin the process again.

## Public Information Office

## ★ Lockheed Aeronautical Systems Company

Burbank, California 91506-2100

## GROUNDWATER MONITORING PROGRAM IN BURBANK

- 1979 Traces of trichlorethylene (TCE) and perchlorethelyne (PCE) are discovered in San Fernando Valley groundwater. These chemicals were used for years throughout the valley for industrial degreasing and other applications.
- 1980 Burbank closes wells that had been used for drinking water.
- 1983 Lockheed begins working in cooperation with the California Regional Water Quality Control Board to inventory its underground containers (tanks, clarifiers and sumps). Although the board only required a fraction of the tanks to be inventoried, Lockheed provided an inventory of all its underground containers.
- 1984 Lockheed becomes the first company -- out of the 88 San Fernando Valley manufacturers selected by the board -- to test its underground containers for leaks.
- 1985 Soil samples are taken from beneath containers holding solvents, fuels and hydraulic oils. Of the more than 140 containers, two showed evidence of leaks. To monitor the quality of groundwater beneath its property and that of the local community, Lockheed proposes to install 12 test wells, at its own expense, throughout its Burbank facilities.
- 1986 Wells installed on Lockheed property begin providing data for groundwater quality at Lockheed and the surrounding community.
- 1987 In April, Lockheed reports to the board that its wells have detected levels of PCE and TCE above the safe drinking water standards recommended by the state.
- Four additional wells, upgradient of the previous wells, are installed to determine the quality of groundwater entering Lockheed property. These wells show that significant levels of contamination are present in this groundwater, indicating sources of contamination other than Lockheed.
- 1988 Lockheed constructs an Aqua-Detox facility near Bldg. 175 for cleaning of groundwater and soil gases.

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Public Information Office

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## LOCKHEED AERONAUTICAL SYSTEMS COMPANY

Lockheed Aeronautical Systems Company (LASC), a division of Lockheed Corporation, is one of the world's largest producers of military aircraft. Headquartered in Burbank, Calif., the company employs 37,000 people and has major manufacturing and modification facilities in Marietta, Ga.; Ontario, Calif.; Palmdale, Calif.; and Greenville, S.C. The Kelly Johnson Research and Development Center near Santa Clarita, Calif., conducts tests and experiments to advance aerospace knowledge and to verify design aspects of company products.

## \* Burbank Operations \*

LRAACA: In October 1988 the U.S. Navy selected LASC-Burbank to develop the nation's next-generation maritime patrol aircraft, the Long-Range Air Anti-submarine Warfare Capable Aircraft (LRAACA). Lockheed will build up to 125 aircraft in the 1990s.

P-3C Orion: Under production at LASC's Burbank and Palmdale facilities, the P-3C Orion is the U.S. Navy's primary long-range anti-submarine warfare (ASW) aircraft. Lockheed has delivered more than 600 P-3s in various models to the U.S. Navy and the armed forces of nine other nations.

P-3 AEW&C: Lockheed is developing an airborne early warning and control (AEW&C) version of the P-3. In 1988 Lockheed delivered one AEW model to the U.S. Customs Service, which has an additional aircraft on order with options for two more. The service will use its aircraft to detect and track drug smugglers.

S-3 Viking: Designed for protection of naval fleets at sea, 187 S-3A Vikings were built for the Navy during the 1970s. Lockheed is modifying as many as 116 Vikings to a "B" version with improved avionics and weapon systems. Another 16 Vikings will be modified to an ES-3A electronic reconnaissance configuration.

L-1011 TriStar: LASC-Burbank produced 250 L-1011 TriStar wide-bodied commercial jetliners between 1970 and 1983. Lockheed is committed to maintaining first-class technical support as long as there are TriStars in service. Currently 243 TriStars are flown by domestic and foreign airlines as well as the Royal Air Force.

C-17: In 1987 LASC received a contract from McDonnell Douglas to produce wing components for an expected 210 U.S. Air Force C-17 transports. Work is being performed at LASC facilities in Burbank, Palmdale and Marietta.

\* Advanced Development Projects \*

TR-1: Production has been under way since 1980 in Palmdale, Calif., of the U.S. Air Force's TR-1 tactical reconnaissance aircraft, which can provide immediate detailed information to battlefield commanders. The USAF will receive the last of 35 aircraft in 1989. An additional aircraft in this series, designated ER-2 (for Earth resources), was delivered to NASA in June 1981. A derivative of Lockheed's U-2, the TR-1 features the same engine and airframe as the U-2R model.

SR-71 Blackbird: Lockheed produced the U.S. Air Force's SR-71 Blackbird during the 1960s. Holder of several world speed and altitude records, the SR-71 is a highly sophisticated strategic reconnaissance aircraft, equipped with advanced sensor systems to provide key intelligence to the Air Force and other federal agencies. Although the SR-71 is no longer in production, Lockheed performs modification and overhaul work for the USAF.

\* Advanced Tactical Fighter Programs \*

In 1986 the U.S. Air Force awarded one of two \$691 million contracts for the design, manufacture and flight test of two Advanced Tactical Fighter (ATF) prototypes to Lockheed, which is teamed with General Dynamics' Fort Worth, Texas, Division and Boeing Advanced Systems Company of Seattle, Wash. Designated YF-22As, both prototypes will share the same airframe design based on a concept developed by Lockheed, which is the prime contractor. Two Pratt-and-Whitney engines will power one prototype while General Electric engines will propel the second. Should the Air Force select one of the YF-22As as the basis for a production model, the three team members will manufacture 750 ATFs. Deliveries will begin in 1993.

\* Research, Technology and Engineering \*

LASC facilities continually undertake research and development activities in aerospace and related fields such as artificial intelligence. The company's Kelly Johnson Research and Development Center at Rye Canyon near Santa Clarita, Calif., conducts some of the country's most advanced research and testing in numerous areas, including structures and materials, avionics, flight sciences, acoustics, vehicle systems and fluid dynamics. The company has opened a Composite Development Center in Burbank for the study of organic matrix composites.

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\* Georgia Operations \*

C-5 Galaxy: Between 1965 and 1973, Lockheed built 81 C-5A Galaxies for the U.S. Air Force. In 1987 LASC-Georgia completed a wing-modification program to extend the C-5A's service life well into the next century. In 1982 the Air Force ordered 50 C-5B Galaxies, incorporating an improved wing, improved General Electric TF-39 engines, tougher aluminum alloys and state-of-the-art avionics. The 50th aircraft is scheduled for delivery during early 1989.

C-130 Hercules: The C-130 Hercules is the world's most widely used turbine-powered heavy transport. Operators in 62 nations have received more than 1,860 of the four-engine propjets since the mid-1950s. Air carriers in 26 countries fly the civil versions. Lockheed has offered to modify two of the U.S. Coast Guard's 31 HC-130H Hercules by installing the 360-degree General Electric APS-138 radar.

C-141 StarLifter: Lockheed's Georgia facilities delivered the first of 285 C-141 StarLifter airlift-airdrop planes aircraft to the U.S. Air Force's Military Airlift Command in 1965. In 1983 the company completed a modification program to lengthen the fuselages of 271 aircraft by 23 1/3 feet (7 m) and add an aerial refueling system.

\* Ontario Operations \*

LASC-Ontario consists of facilities in Ontario, Upland and Chino, Calif.; Greenville, S.C.; and Arlington, Texas. LASC-Ontario is recognized as a leader in the design, systems integration, and modification of aircraft into special airborne platform configurations for electronic warfare; command, control and communications; special operations forces; and other high-technology systems. The company has processed nearly 200,000 aircraft during the past 50 years. Among special modifications the company has performed are installation of the Gerard P. Kuiper Airborne Observatory on NASA's C-141 StarLifter and the design and conversion of nine C-130 Hercules into airborne emergency hospitals.

LASC-Ontario also designs and manufactures aircraft systems trainers in support of such programs as the C-5 Galaxy and the Hughes AH-64 advanced attack helicopter. The firm's flight data recorders are used on every commercial aircraft type manufactured in the Free World.

## HISTORY

Lockheed Corporation's original factory in Burbank, purchased in 1928 to house the rapidly expanding production of wooden aircraft, is today part of Lockheed Aeronautical Systems Company. Here were built such famous aircraft of the 1920s and 1930s as the Vega, Air Express, Sirius, Altair and the original Orion -- flown by such aviation pioneers as Amelia Earhart, Wiley Post, Charles Lindbergh, Jimmy Doolittle and Howard Hughes. Because of the popularity of the original Electra airliner, the company organized a customer service branch, the predecessor to the Ontario operations, in 1938.

During World War II, Lockheed's Burbank factories built more than 19,000 military airplanes, including P-38 Lightning fighters, Hudson bombers, Ventura and Harpoon Navy patrol planes, Lodestar transports and Boeing-designed B-17s. Post-war production aircraft included the commercial and military Constellation series, Navy P-2 Neptune ASW plane, F-80 Shooting Star, F-94 Starfire, Air Force T-33 jet trainer, Navy T-1A trainer, and the U-2 high-altitude research aircraft.

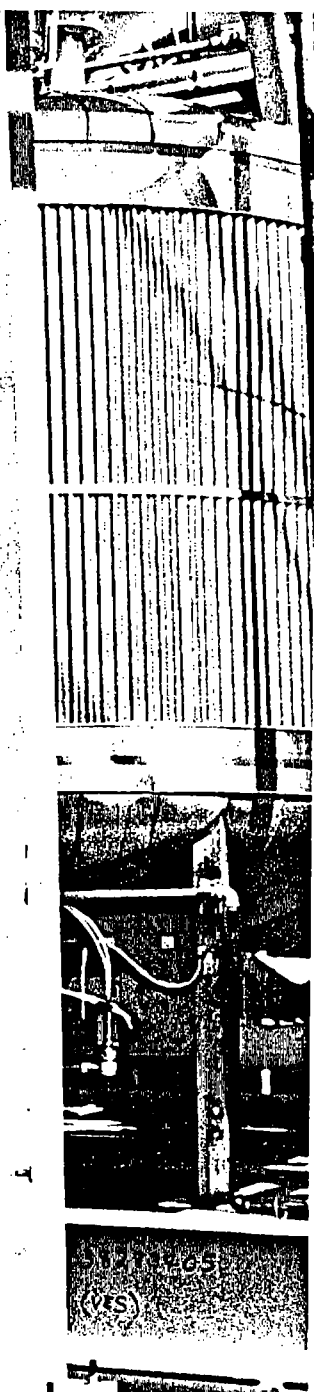
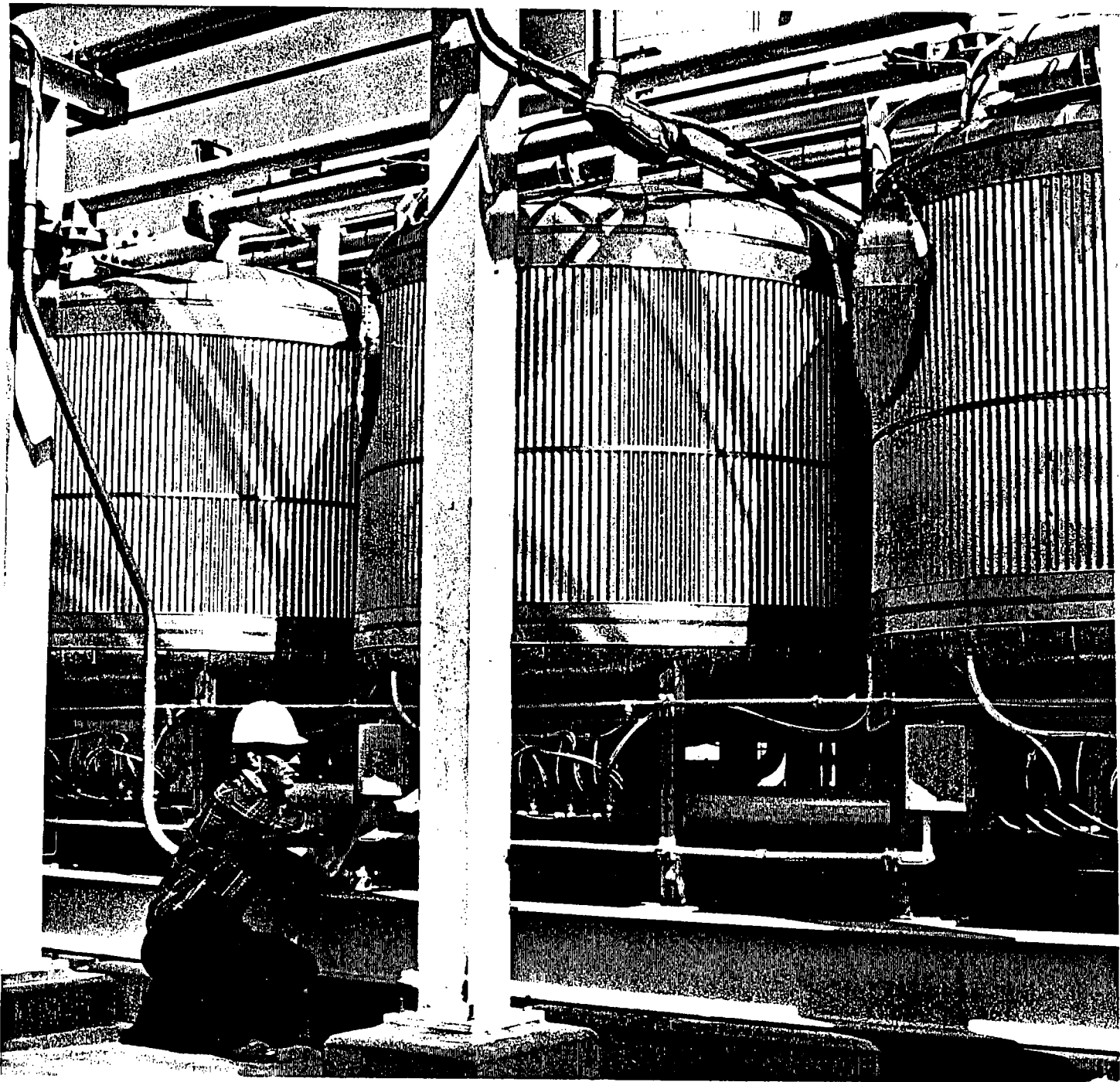
In 1951 Lockheed reopened Air Force Plant 6 in Marietta, Ga., to modify Boeing-built B-29 bombers for the Korean Conflict. Later the plant produced the Boeing-designed B-47 bomber as a second source. In 1953 the Georgia facility began manufacture of the C-130 Hercules, which it continues to produce. The Georgia factories also have built the JetStar, the world's first jet-powered business aircraft, as well as the C-141 StarLifter and the C-5 Galaxy.

Meanwhile, Lockheed's Burbank facilities concentrated on assembling the Constellation and L-188 Electra commercial airliners and the F-104 Starfighter for the Air Force. Its U-2, TR-1 and SR-71 aircraft have established LASC-Burbank as the chief supplier of high-altitude reconnaissance aircraft to the federal government, and its S-3 Viking and P-3 Orion series continue the firm's long history of producing U.S. Navy maritime patrol aircraft.

In 1987 Lockheed integrated the operations of what until then had been three separate divisions of the corporation: Lockheed-California Company, Lockheed-Georgia Company, and Lockheed Aircraft Service Company. The new company, Lockheed Aeronautical Systems Company, will enable Lockheed to more effectively serve the needs of its customers and expand its lines of business into new areas during the 1990s and beyond.

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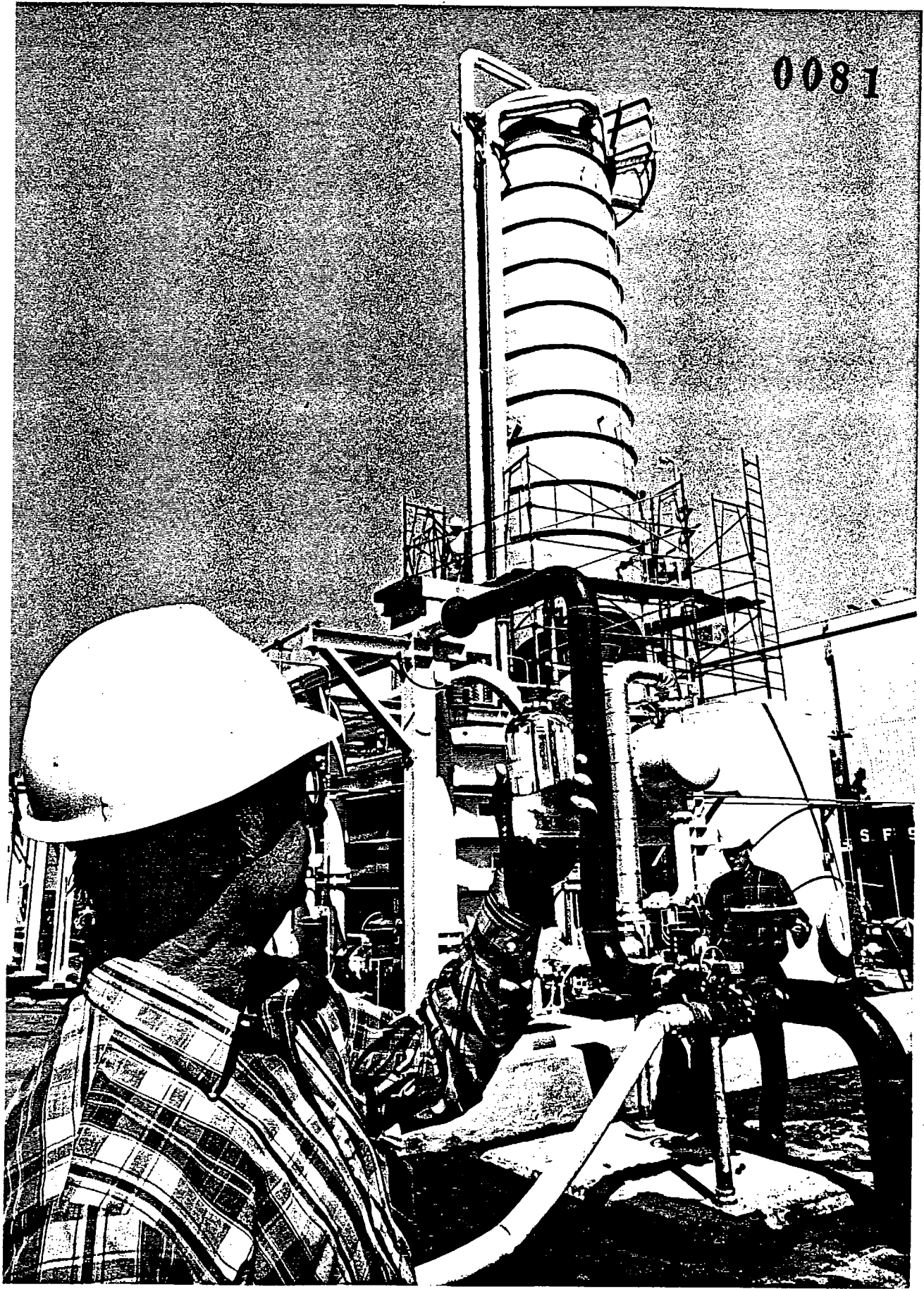
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SOIL TANKS--Gases in the soil beneath Lockheed Aeronautical Systems Company's Burbank facilities are cleaned of industrial solvents in the company's new Aqua-Detox facility. Soil gases are filtered through these tanks, which contain beds of granular carbon. Volatile organic compounds are extracted from the gases and stored for recycling. The facility is also equipped to purify groundwater.

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\* Lockheed photo by Eric Schulzinger

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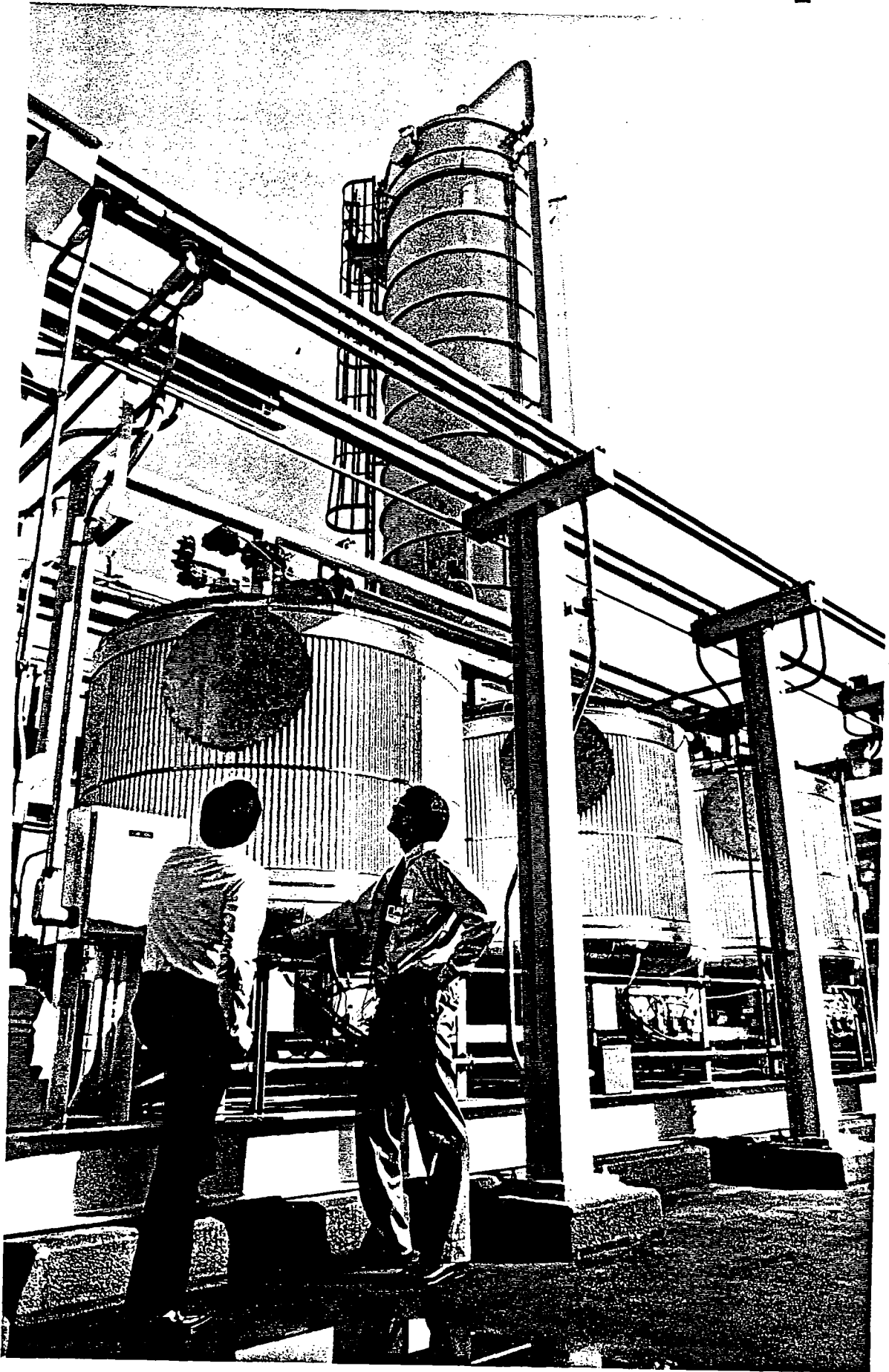
CLEAN WATER--Groundwater flowing beneath Lockheed Aeronautical Systems Company's Burbank facilities is now being cleaned of industrial solvents in this new treatment facility. A Lockheed engineer examines water that has been purified of the solvents, which were removed in the stripping tower (background) and stored for recycling.

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\* Lockheed photo by Eric Schulzinger

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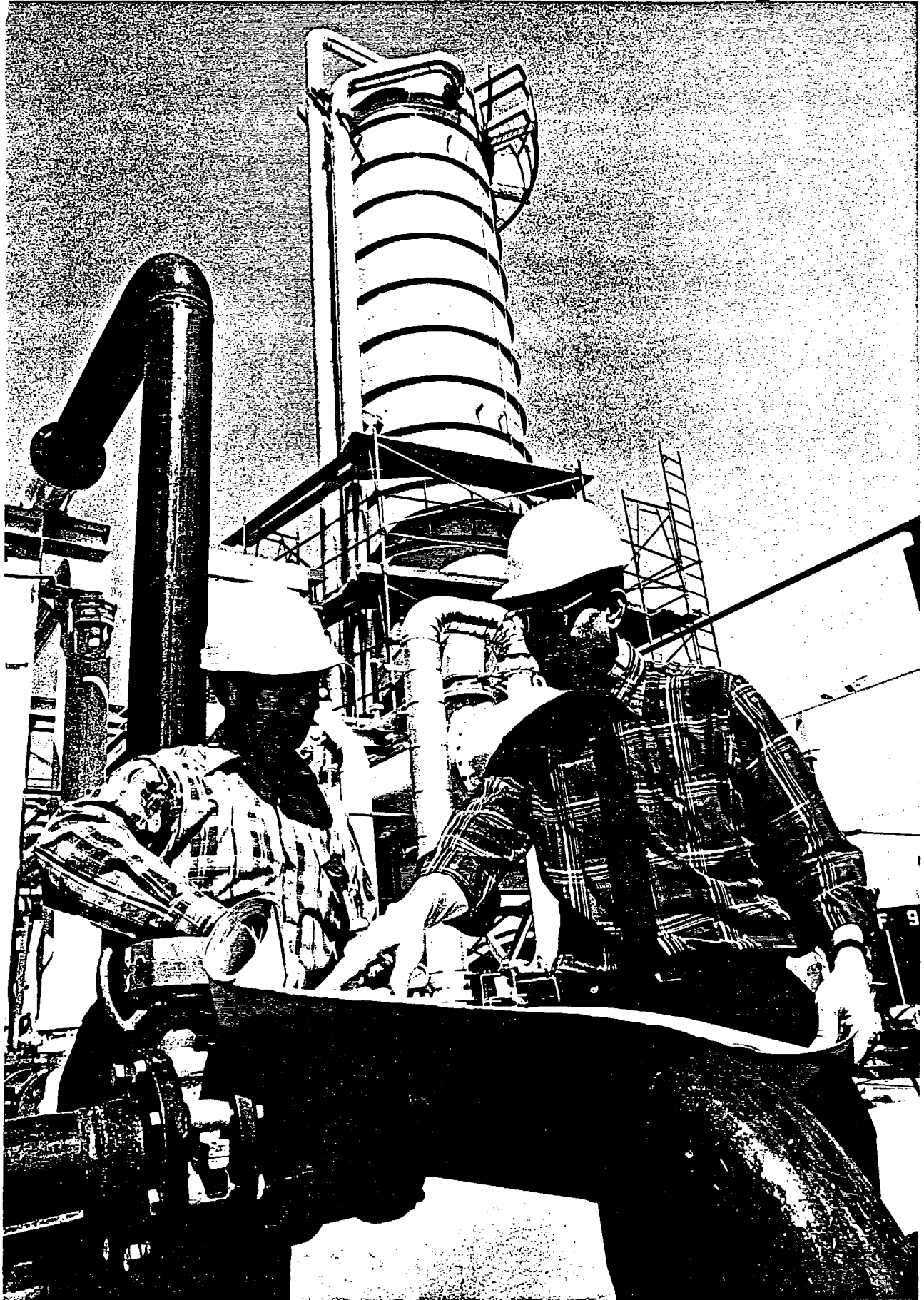
SOIL CLEANING--Although its primary purpose is the removal of industrial solvents in the groundwater, the new Aqua-Detox facility at Lockheed Aeronautical Systems Company in Burbank also purifies the soil of these substances. Gases from the soil are filtered through the three tanks pictured here, which contain beds of granular carbon. The 60-foot water-stripping tower can be seen in the background. Neither process expels contaminants into the atmosphere, but stores them for recycling.

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\* Lockheed photo by Eric Schulzinger

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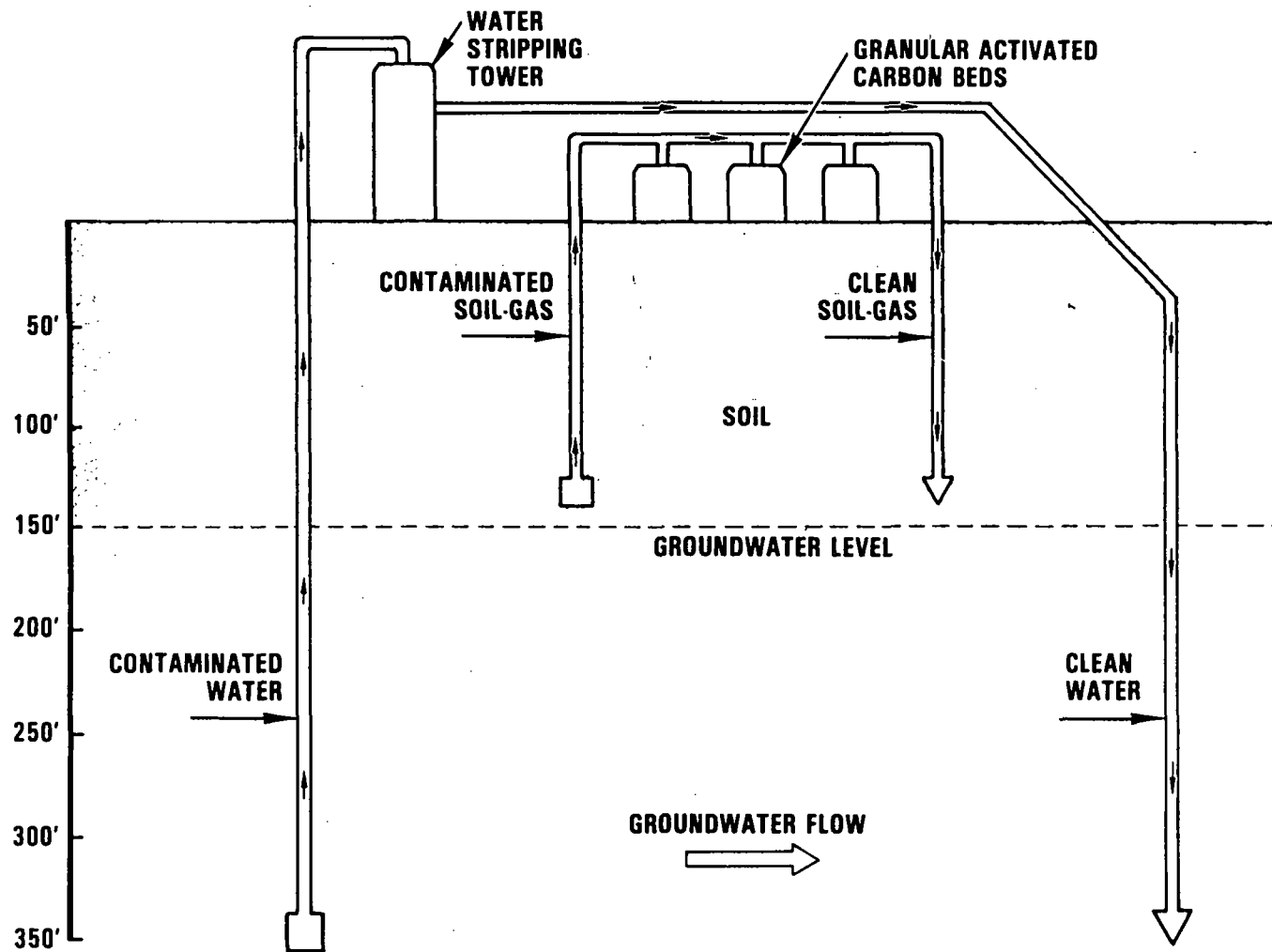
NEW FACILITY--Ready to begin operations at Lockheed Aeronautical Systems Company's Burbank plant is this new water and soil purification facility. In the photo, Lockheed engineers survey blueprints of the facility, which is dominated by a 60-foot stripping tower that separates volatile organic compounds from the groundwater and stores them for recycling.

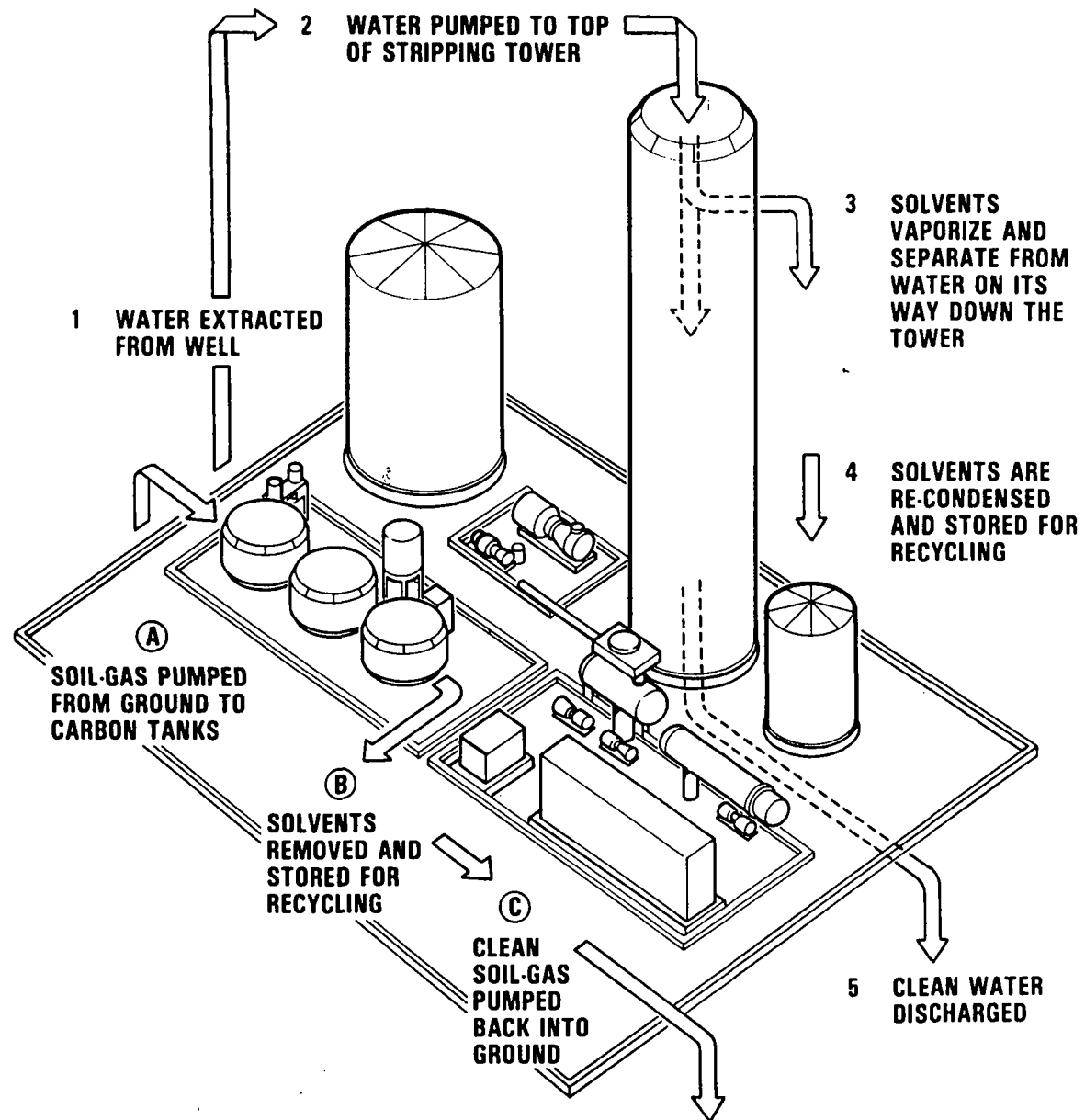
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\* Lockheed photo by Eric Schulzinger

November 1988







# Lockheed Will Purify Burbank Toxic Water

By GREG BRAXTON, Times Staff Writer

Lockheed Corp. on Thursday announced that it is using a \$4-million treatment system to clean chemically tainted ground water beneath its Burbank plant.

The corporation decided to build the Aqua-Detox Ground Water Treatment Facility in response to an August, 1987, order by state water officials. The state Water Quality Control Board said the Lockheed plant had contributed to pollution of ground water that forced the closure of more than 30 municipal water wells in Burbank and North Hollywood.

The Aqua-Detox system, on a corner of the plant site near the corner of Buena Vista Street and Empire Avenue, is cleaning 1.5 million gallons of water a day, Lockheed officials said. The water is pure enough for drinking, company officials said, although Burbank has no immediate plans to add the water to its municipal supply.

## Steam and Aeration

Topped by a 60-foot tower, the system utilizes steam and aeration to reduce contaminants to within health guidelines, Lockheed officials said.

E. Lloyd Graham, Lockheed's executive vice president and general manager of operations, said the system is unique in that no contaminants are expelled into the atmosphere as waste. The contaminants are separated from the ground water and recycled, he said.

"With this system, the only product is clean water," Graham said. He said the water contains no detectable pollutants and is cleaner than stipulated by state health guidelines.

The system has been in operation

since mid-September, company officials said.

The water is being discharged into a storm drain and into the ocean, but Lockheed hopes to eventually pump the treated water into Burbank's water supply.

Water beneath the Burbank plant contains PCE or perchloroethylene, levels as high as 12,000 parts per billion, and TCE, or trichloroethylene, levels as high as 2,000 p.p.b., Lockheed consultants say. Both chemicals are used for removing grease from metal and for dry-cleaning, and are thought to cause cancer with chronic exposure. Under health guidelines, PCE and TCE levels in drinking water are not to exceed 4 p.p.b. and 5 p.p.b., respectively.

## How System Works

Lockheed officials explained the system as follows:

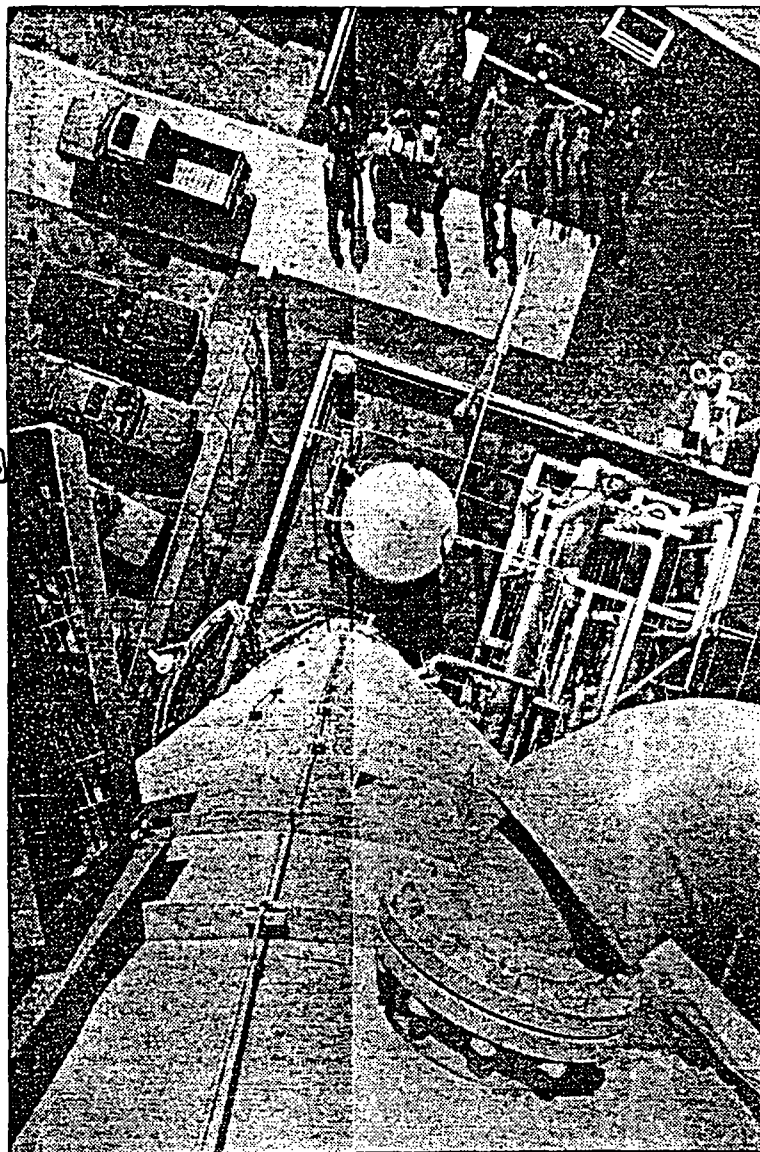
Ground water is extracted from a 350-foot-deep well near the Lockheed plant and pumped to the top of the tower. The solvents are vaporized and separated from the water before the water reaches the bottom of the tower.

The vaporized solvents are condensed and pumped to a storage tank. They are then collected for recycling.

The system also treats and cleans soil gases, company officials said.

Fred Lantz, water system manager of the Burbank's Public Service Department, said the city has discussed with Lockheed purchasing the recycled water.

Lantz said several conditions, including approval from the state Department of Health Services,



BOB CAREY / Los Angeles Times

View from the 60-foot tower at Lockheed's treatment facility.

must be met before the city can purchase the water.

Lockheed officials said they would like to sell the recycled water back to Burbank or another municipality. When the plant is

operating at capacity, Lockheed pays Burbank \$25,000 a month for water, including that it extracts from the ground, cleanses and drains into the ocean, company officials said.

## GROUNDWATER FACILITY, FIRST ADD

Located near the corner of Empire Avenue and Buena Vista Street in Burbank, the facility took just seven months from initial design to its completion in mid-September.

Lockheed's action responded to high levels of industrial solvents that its monitoring program detected in the groundwater. In September 1987 the company proposed to the board a plan to clean both water and soil in the area.

"While a leaking Lockheed clarifier near the site is suspected to have contributed to the situation, it is clear that substantial contamination is coming into this area from sources off Lockheed property," Faeder said.

He added that at times the company's monitoring system had detected contamination coming from "upstream" of Lockheed land at levels as much as four times those at the Empire and Buena Vista site.

"The groundwater problem in our community is serious, and Lockheed is taking an aggressive approach to help deal with it, using the best technologies available," Faeder said.

The facility's ability to purify both water and soil sets it apart from most of its type, Faeder said.

The treatment system was designed and built by AWD Technologies, an environmental services contractor based in San Francisco. It will operate until groundwater and soil contamination is reduced to acceptable levels, Faeder said.

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